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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/829,598

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Jason A. Gratz

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6855

23713

7590

08/13/2009

GREENLEE WINNER AND SULLIVAN P C

4875 PEARL EAST CIRCLE

SUITE 200

BOULDER, CO 80301

EXAMINER

HODGE, ROBERT W

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

08/13/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/829,598

Applicant(s)

GRAETZ ET AL.

Examiner

ROBERT HODGE

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 June 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-15,18-21,41,42,46-54,56-60 and 62-72 is/are pending in the application.
- 4a) Of the above claim(s) 19-21 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-15,18,41,42,46-54,56-60 and 62-72 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Final Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Arguments

Applicant's arguments, see Remarks, filed 6/17/09, with respect to the rejection of claim 51 under 35 U.S.C. 112, second paragraph have been fully considered and are persuasive. The rejection of claim 51 under 35 U.S.C. 112, second paragraph has been withdrawn.

Applicant's arguments, see Remarks and Amendments, filed 6/17/09, with respect to the prior art rejections with Zhou, Sammels and Kriesel have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of U.S. Pre-Grant Publication No. 2003/0054252.

Applicant's arguments filed 6/17/09 with respect to the Saitoh reference have been fully considered but they are not persuasive. Applicants base their arguments on the amendments to the claims which will be fully addressed in the grounds of rejection below. With specific regard to the recitation in claim 1 regarding only one layer, at least the intermediate product of Saitoh reads on said recitation because during production since each layer is formed one at a time there will be an intermediate product that will only have one layer of Si and Ge on a substrate and therefore Saitoh still reads on said recitation as clarified above. With regards to the recitation of "framework material" applicants are asking the Examiner to read limitation from the specification into the claims (see page 9, third full paragraph). If applicants would like to include limitations

from the specification in to the claims, than applicants are invited to do so by amendment to the claims.

Drawings

The drawings are objected to because not all of the figures are labeled such as Figures 3A-3D. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 72 is objected to under 37 CFR 1.75 as being a substantial duplicate of claim 69. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 2, 7-15, 18, 51 and 63-66 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The negative recitation of "only one layer of framework material is present in the electrode, such as is recited in claim 1 is new matter. Applicants state that support can be found for the amendment can be found in Figure 3A and paragraph 59. First and foremost there is no figure in the drawings labeled 3A and there is nothing in the figures or the specification that supports the recitation that only one layer is present. The negative recitation of "not in the form of an aggregate" such as is recited in claim 63 is new matter. Applicants state the support

for the amendment can be found in Example 9. However there is no disclosure anywhere in the specification of the term "aggregate". The recitation of "lithium salt" such as is recited in claims 64-66 is new matter. Applicants state that support for the amendment can be found in paragraph 67, however no support can be found. Only LiPF_6 can be found. The disclosure of one species out of an entire genus does not support an amendment claiming the entire genus.

Claim Rejections - 35 USC § 102

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 4-6, 8-10, 13-15, 46-51, 63, 67, 70 and 71 are rejected under 35 U.S.C. 102(a/e) as being anticipated by U.S. Pre-Grant Publication No. 2003/0165697 hereinafter Saitoh.

Saitoh teaches a nanostructured layer 113 (i.e. framework in the form of a nanofilm) of a silicon-germanium alloy of formula $\text{Si}_{(1-z)}\text{Ge}_z$ (where $0 < z < 1$) that has a thickness of 1.0 nm or less, which inherently requires particle diameters that are less than those recited in claims 4-6, wherein the layer is supported by a substrate 112, that is conductive, said layer is contiguous and continuous and a conductive diluent is present (figure 3, paragraphs [0014], [0017] and [0037]-[0045]). It is noted that the preamble limitation "an electrode for a secondary electrochemical cell" is not given patentable weight because there is no structure in the body of the claims that provides any positive recitation for said preamble and therefore the body of the claim reads on a

layer of nano-structured material regardless of its application or intended use. It is further noted that claims 49 and 50, further limit optional structure in the respective parent claims and therefore since one of the two optional structures has been found in the prior art Saitoh reads on the claims as recited. The Examiner notes because the instantly claimed invention has been found in the prior art, it reads on the intended use and the properties recited in claims 13-15. With specific regard to the recitation in claim 1 regarding only one layer, at least the intermediate product of Saitoh reads on said recitation because during production each layer is formed one at a time there will be an intermediate product that will only have one layer of Si and Ge on a substrate and therefore Saitoh still reads on said recitation.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saitoh as applied to claim 1 above, and further in view of U.S. Pre-grant Publication No. 2002/0123183 hereinafter Fitzgerald.

Saitoh does not teach that the layer is amorphous.

Fitzgerald teaches that layers of SiGe that are amorphous are used as protective layers (paragraph [0041]).

At the time of the invention it would have been obvious to one having ordinary skill in the art to make the SiGe layer of Saitoh amorphous as taught by Fitzgerald in

order to provide a protective layer that protects the strained-Si layer during processing. If a technique has been used to improve one device (using an amorphous SiGe layer), and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way (providing a protective layer that protects the strained-Si layer during processing), using the technique is obvious unless its actual application is beyond his or her skill. See MPEP 2141 (III) Rationale C, KSR v. Teleflex (Supreme Court 2007).

Claims 41, 42, 46-50, 52, 53, 56-59, 62 and 65-72 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pre-Grant Publication No. 2003/0054252 hereinafter Kusumoto in view of WO 01/96847 hereinafter Zhou.

Kusumoto teaches an electrode for a secondary electrochemical cell, the electrode comprising a germanium alkali metal alloy layer such as Li-Ge that is continuous and amorphous on a conductive metal substrate that is a current collector, the electrode is the anode in the electrochemical cell and the electrochemical cell also comprises a cathode and an electrolyte containing a lithium salt (whole document).

Kusumoto does not teach that the layer comprises a nanostructured material.

Zhou teaches an electrode for a secondary electrochemical cell comprising a nanostructured germanium layer or an alkali metal alloy layer, such as a lithium metal alloy containing Germanium with a conductive diluent, wherein the nanostructured material can be nanoparticles having a diameter between 1-50 nanometers or a nanofilm that is coated onto a current collector and a binder is present (see pages 3-8).

At the time of the invention it would have been obvious to one having ordinary skill in the art to optimize the alloy structure size of Kusumoto as taught by Zhou in order to provide a secondary electrochemical cell electrode having a high capacity, increased cyclability and that has improved stability thus increasing the overall life of the secondary electrochemical cell and also since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art, in the absence of unexpected results. In re Boesch, 617 E.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 49, 50, 53 and 58, Kusumoto as modified by Zhou teaches the claimed invention except for multiple electrode layers and current collector layers. It would have been obvious to one having ordinary skill in the art at the time the invention was made to duplicate the electrode and current collector layers of Kusumoto as modified by Zhou, since it has been held that mere duplication of the essential working part of a device involves only routine skill in the art. St. Regis Paper Co. v. Bemis Co., 193 USPQ 8.

It is noted that claims 56 and 62 further limit optional limitations of their parent claims and therefore since one of the optional structures has been found in the prior art Kusumoto as modified by Zhou reads on reads on the claims as recited.

Claims 54 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kusumoto in view of Zhou as applied to claims 41 and 42 above, and further in view of U.S. Pre-Grant Publication No. 2004/0106741 hereinafter Kriesel.

Kusumoto as modified by Zhou does not teach the specific thickness of the nanofilm, but does teach that the size of the particles used in the film, which when used as a coating such as in Zhou would form a very thin nanofilm.

Kriesel teaches that the thickness of nanofilms can be formed in a range of 1-30 nanometers (paragraphs [0018] and [0191]).

At the time of the invention it would have been obvious to one having ordinary skill in the art to optimize the thickness of the nanofilm of Kusumoto as modified by Zhou in a range of 1-30 nanometers as taught by Kriesel in order to provide an electrode that has an increased capacity without increasing the overall size of the secondary electrochemical cell that the electrode will be used in and also since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art, in the absence of unexpected results. In re Boesch, 617 E.2d 272, 205 USPQ 215 (CCPA 1980).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT HODGE whose telephone number is (571)272-2097. The examiner can normally be reached on 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Robert Hodge/
Examiner, Art Unit 1795

